

Original Research

Newborn care knowledge and practices among mothers in Baguio City, Philippines: A descriptive correlational study



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Abstract

Background: Maternal knowledge and practices on newborn care are crucial in ensuring the well-being of infants, particularly in areas such as cord care, pain and fever management, and stimulation of senses. The Department of Health (DOH) and other health programs aim to promote better newborn care practices, but maternal knowledge gaps may persist.

Objective: The study aimed to assess the level of knowledge and practice of mothers regarding newborn care, specifically focusing on cord care, pain and fever management, and stimulation of senses.

Methods: A quantitative descriptive correlational design was used. The study involved 308 mothers from three barangays in Baguio City, selected using stratified random sampling. Data were collected from 6 February 2023 to 20 March 2023 through a self-administered questionnaire. Descriptive and inferential statistics were used to analyze the data.

Results: Mothers had high knowledge of cord care and stimulation of senses, and average knowledge of pain and fever management. For practice, mothers scored highly in cord care, pain and fever management, and stimulation of senses. Significant differences were found in knowledge of pain and fever management

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by age ($p = 0.044$) and civil status ($p = 0.015$). A weak, significant positive correlation ($r = 0.229, p < 0.001$) was observed between knowledge and practice.

Conclusion: The study found a positive relationship between knowledge and practice, indicating that informed mothers are more likely to implement appropriate newborn care practices. There is a need to enhance maternal education, especially on pain and fever management, to promote better neonatal outcomes. Health programs should continue to focus on improving maternal knowledge through accessible information and support.

Keywords

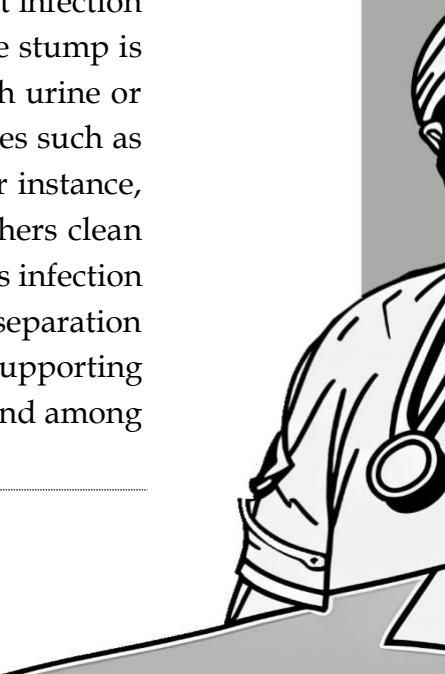
Philippines; infant; mothers; knowledge; practice; newborn

Background

The United Nations Sustainable Development Goal (SDG) #3 underlines the importance of ensuring healthy lives and promoting well-being for all at all ages. A critical target under this goal is to reduce neonatal mortality to at least 12 per 1,000 live births and under-5 mortality to at least 25 per 1,000 live births by 2030 (WHO, 2022). Significant progress has already been made globally, with neonatal deaths decreasing from 5 million in 1990 to 2.4 million in 2020 (WHO, 2022). In the Philippines, neonatal mortality rates have similarly declined, from 25 per 1,000 live births in the 1970s to 12.6 per 1,000 live births in 2020 (UNICEF, 2022). These improvements are largely attributed to advances in prenatal care, skilled assistance during labor, and postpartum care for mothers and newborns.

While institutional healthcare measures have contributed significantly to improving newborn survival, the role of parents, particularly mothers, remains crucial in newborn care. Our study aims to determine the level of knowledge and practice of mothers on newborn care, focusing on cord care, pain and fever management, and stimulation of senses.

Mothers play a vital role in maintaining proper cord care to prevent infection and promote health. The WHO recommends dry cord care, where the stump is kept clean and dry, and water is used only if the stump is soiled with urine or feces (WHO, 2022). This practice excludes the application of substances such as antiseptics or alcohol, which are commonly used in some regions. For instance, Valladolid (2018) and Agossou et al. (2016) observed that many mothers clean the stump with 70% alcohol multiple times a day, believing it prevents infection and speeds healing. However, studies show that alcohol delays cord separation compared to dry cord care (Quattrin et al., 2016). Despite evidence supporting dry cord care, traditional practices persist, particularly in rural areas and among



indigenous populations in the Philippines, where these beliefs are passed down generationally (Jose et al., 2019).

In addition to cord care, pain and fever management are significant concerns for mothers. Fever is a common symptom in newborns, often causing anxiety for caregivers. Walsh et al. (2007) highlighted that maternal approaches to fever management are influenced by personal experiences and the sources of information they rely on. Studies reveal a range of practices, from using nonprescribed medications to traditional remedies such as herbal plants (Leocadio et al., 2011). Similarly, colic pain is another challenge, with mothers in the Philippines using methods like applying chewed leaves to the newborn's abdomen (Ebuenga, 2017). Globally, studies have shown varied practices for managing colic pain, including the use of paracetamol, herbal mixtures, and even breast milk (Chinawa et al., 2013; Ezen & Acikgoz, 2018). These findings emphasize the need for proper health education to equip mothers with effective and safe approaches to managing newborn ailments.

Another essential aspect of newborn care is the stimulation of senses, which contributes to healthy development. While newborns are typically born with fully developed sensory systems, the knowledge and practices of mothers regarding stimulation vary widely. For example, Arcigal et al. (2013) found that both first-time and experienced mothers demonstrated similar knowledge of newborn massage, a practice beneficial for sensory and physical development. However, Whitmarsh (2011) noted gaps in maternal practices, such as a lack of engagement in child-directed speaking and reading to newborns. These findings highlight the importance of educating mothers about the role of sensory stimulation in early childhood development.

Existing research on maternal knowledge and practices in newborn care often focuses on topics such as breastfeeding and immunization (Bagherian et al., 2021; Berhan & Gulema, 2018; Ebuenga, 2017; Kelly et al., 2017). However, there is limited exploration of essential practices like cord care, fever and pain management, and sensory stimulation, especially in the context of the Philippines and specifically in Baguio City. This study aimed to fill this gap by examining maternal knowledge and practices in these areas and their relationship to demographic factors such as age, civil status, and the number of children.

Our study is grounded in two theoretical frameworks. Albert Bandura's Social Learning Theory (Bandura, 1977) posits that people learn behaviors through observation, imitation, and modeling. Mothers often adopt newborn care practices based on what they observe in their communities, mediated by personal reflection and perceived outcomes. Additionally, the Knowledge, Attitude, and Practices (KAP) framework explains that knowledge is the foundation of

behavior change, attitudes drive this change, and practices are the outcomes. By understanding the relationships between these elements, this study seeks to provide insights into how maternal knowledge influences practices and how these can be improved to align with evidence-based standards, thereby contributing to healthier outcomes for newborns.

Methods

Study Design

This study employed a quantitative, descriptive-correlational research design to determine the level of knowledge and practice of mothers on newborn care and to examine the relationships between these levels and selected demographic variables.

Samples/Participants

The study was conducted in Baguio City, focusing on three barangays: Fairview Village, Camp 7, and Irisan. A stratified random sampling technique was used, resulting in a total of 308 mothers participating in the study, with 116 mothers from Barangay Irisan, 95 from Barangay Fairview, and 97 from Barangay Camp 7. The inclusion criteria for participants were as follows: mothers aged 18 to 40 years old who were literate in English, Tagalog, or Ilocano, able to read and write, and had given birth within the last two years, regardless of the type or location of delivery (hospital, birthing center, or home). Mothers who gave birth within the last two years but were younger than 18 or older than 40 were excluded from the study.

Instruments

The study utilized a self-constructed questionnaire, which was developed and adapted to assess mothers' knowledge and practices regarding newborn care. The questionnaire comprised 26 items each for knowledge and practice, covering the areas of cord care, pain and fever management, and stimulation of senses. These items were based on standards from the World Health Organization (WHO) and the Department of Health (DOH) in the Philippines [<https://caro.doh.gov.ph/wp-content/uploads/2014/09/EINC.pdf>].

The knowledge section employed a dichotomous True/False scale, while the practice section used a Yes/No format. To ensure accessibility for participants, the questionnaire was translated into Tagalog and Ilocano by language experts. Content validity was established through evaluation by a panel of experts, resulting in a Content Validity Index with a Cronbach alpha of 0.8. Reliability



testing was conducted with a sample of ten mothers who shared similar characteristics with the study respondents, yielding a reliability score of 0.8123.

Data Collection

Participants completed the questionnaire in their homes, with most requiring 10 to 15 minutes to answer. Participants with limited availability were given up to two hours. The researchers and research assistants collected the completed forms and verified that all items had been answered. Data collection took place from 6 February to 20 March 2023.

Data Analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 20 trial version. Descriptive and inferential statistics were used to analyze the data in alignment with the study objectives. The levels of knowledge and practice in cord care, pain and fever management, and stimulation of senses were categorized into high, moderate, and low based on predefined score ranges.

For knowledge, scores of 66.67% to 100% were interpreted as high knowledge, scores of 33.33% to 66.66% were interpreted as average knowledge, and scores below 33.33% were interpreted as low knowledge. Similarly, for practice, scores of 66.67% to 100% indicated a high level of practice, scores of 33.33% to 66.66% indicated a moderate level of practice, and scores below 33.33% indicated a low level of practice.

Pearson's correlation coefficient was used to examine the relationship between knowledge and practice levels.

Ethical Considerations

Ethics clearance for the study was obtained from Saint Louis University's Ethics Review Committee (SLU-REC 2022-051). Formal letters seeking approval were sent to the health offices of Barangay Fairview, Barangay Camp 7, and Barangay Irisan. Upon receiving endorsements, lists of eligible mothers were obtained from the barangays. Informed consent was obtained from all participants after providing them with a detailed explanation of the study's objectives, potential benefits, risks, and ethical considerations. Participation in the study was voluntary, and no compensation was provided. Participants were fully informed about the purpose of the study and their rights, including the right to refuse or withdraw at any time without repercussions. Anonymity and confidentiality were strictly upheld throughout the study. No identifying information was included in the report, and only aggregated data were presented.

Results

Socio-Demographic Profile of Respondents

Table 1 presents the socio-demographic characteristics of the respondents, including age, civil status, and number of children. Among the 308 participants, the majority (27.27%) were aged 20–25 years, followed by 26–30 years (26.95%), 36–40 years (23.38%), and 31–35 years (22.40%). In terms of civil status, most respondents were married (55.52%), while others were cohabiting (36.69%), single (5.52%), or separated/widowed (2.27%). Regarding the number of children, 63.31% of mothers had 1–2 children, 26.95% had 3–4 children, and 9.74% had five or more children.

Table 1 Socio-demographic profile of respondents ($N = 308$)

Characteristic	Category	Frequency	Percent (%)
Age	20–25	84	27.27
	26–30	83	26.95
	31–35	69	22.40
	36–40	72	23.38
Civil Status	Single	17	5.52
	Married	171	55.52
	Cohabitation	113	36.69
	Separated/Widow	7	2.27
Number of Children	1–2	195	63.31
	3–4	83	26.95
	5 or more	30	9.74

Knowledge Levels on Newborn Care

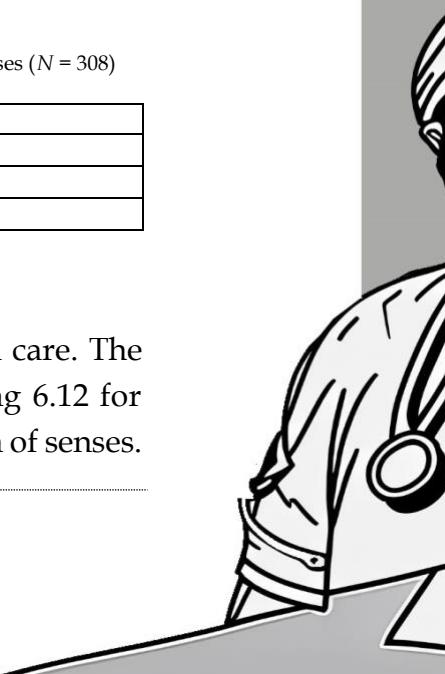
The knowledge levels of mothers on cord care, pain and fever management, and stimulation of senses are detailed in **Table 2**. On average, mothers scored 7.23 on cord care, indicating high knowledge. For stimulation of senses, the mean score was 5.06, also indicating high knowledge. However, for pain and fever management, mothers had a mean score of 7.51, which falls under average knowledge.

Table 2 Level of knowledge of mothers on cord care, pain and fever management, and stimulation of senses ($N = 308$)

Level of Knowledge	Score	Interpretation
Cord care	7.23	High Knowledge
Pain and fever management	7.51	Average Knowledge
Stimulation of senses	5.06	High Knowledge

Practice Levels on Newborn Care

Table 3 summarizes the level of practice among mothers in newborn care. The scores reflect high levels of practice in all areas, with mothers scoring 6.12 for cord care, 8.26 for pain and fever management, and 6.72 for stimulation of senses.



These findings indicate that mothers actively implemented recommended practices in all assessed areas.

Table 3 Level of practice on cord care, pain and fever management, and stimulation of senses ($N = 308$)

Practice Level	Score	Interpretation
Cord care	6.12	High Level of Practice
Pain and fever management	8.26	High Level of Practice
Stimulation of senses	6.72	High Level of Practice

Differences in Knowledge by Socio-Demographic Factors

Table 4 shows that no significant differences were observed in mothers' knowledge based on age, civil status, or number of children for cord care. The p-values for all comparisons exceeded the 0.05 significance level, indicating that these socio-demographic factors did not affect the mothers' understanding of proper cord care. This suggests that cord care knowledge is generally consistent among different groups of mothers.

Table 4 Significant differences in knowledge according to socio-demographic factors

Knowledge Area	Socio-Demographic Factor	F	p-value	Interpretation
Cord Care	Age (20-40)	0.819	0.484	Not significant
	Civil Status (All groups)	0.782	0.505	Not significant
	Number of Children (1-5+)	0.668	0.514	Not significant
Pain and Fever Management	Age (20-40)	2.733	0.044	Significant
	Civil Status (All groups)	3.548	0.015	Significant
	Number of Children (1-5+)	3.408	0.034	Significant
Stimulation of Senses	Age (20-40)	0.927	0.406	Not significant
	Civil Status (All groups)	0.720	0.540	Not significant
	Number of Children (1-5+)	1.283	0.278	Not significant

Regarding pain and fever management, significant differences in knowledge were found according to age, civil status, and the number of children. The p-values for these comparisons (0.044, 0.015, and 0.034, respectively) were all below 0.05, showing that these socio-demographic factors have a significant influence on how well mothers understand how to manage pain and fever in their newborns. This implies that factors such as age, marital status, and experience with children can contribute to the variability in knowledge about managing common neonatal issues.

In terms of stimulation of senses, no significant differences were found in knowledge based on age, civil status, or the number of children. With p-values above 0.05 for all comparisons, it suggests that mothers' understanding of sensory stimulation for newborns is relatively uniform, regardless of these socio-demographic characteristics. This implies that the knowledge in this area does not significantly vary with age, civil status, or number of children.

Correlation Between Knowledge and Practice

Table 5 presents the correlation between knowledge and practice in newborn care. The analysis revealed a weak but significant positive correlation ($r = 0.229$, $p <0.001$), suggesting that higher knowledge levels are associated with improved practices.

Table 5 Correlation between knowledge and practice on newborn care

Variable	Knowledge	Practice
Knowledge (r)	1.000	0.229**
Practice (r)	0.229**	1.000

Note: Correlation is significant at the 0.01 level (2-tailed)

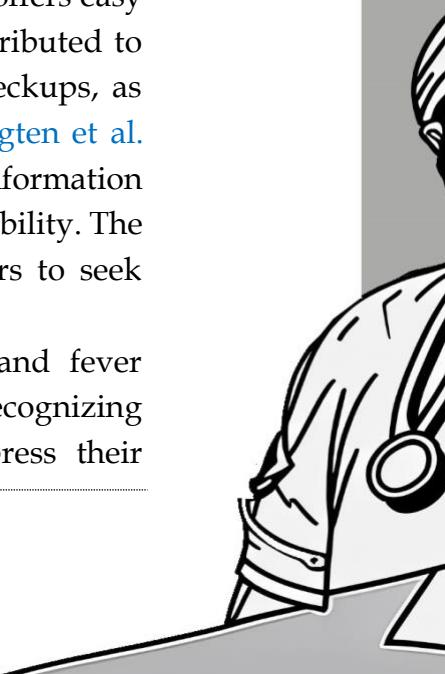
Discussion

Summary of the Findings

This study aimed to assess the level of knowledge and practice of mothers regarding newborn care, specifically focusing on cord care, pain and fever management, and stimulation of the senses. The findings revealed that mothers had high knowledge regarding cord care and stimulation of the senses, with average knowledge in pain and fever management. This suggests that while the majority of mothers possess a solid understanding of essential newborn care practices, there is still room for improvement, particularly in pain and fever management.

The high level of knowledge in cord care and stimulation of the senses may be attributed to effective information dissemination to mothers through various programs and initiatives. Programs such as the Department of Health's (DOH) Unang Yakap, Basic Emergency Obstetric and Newborn Care, and the Aquino health agenda, which focus on reducing neonatal mortality rates, likely contributed to the acquisition of this knowledge. Furthermore, Bandura's theory suggests that both personal knowledge and environmental factors influence learning and behavior (Bandura, 1977). Baguio, as an urbanized city, offers easy access to healthcare facilities and the internet, which may have contributed to mothers' knowledge acquisition through prenatal and postnatal checkups, as well as online resources. This aligns with the study by van der Gugten et al. (2016), which found that parents were able to gain significant information regarding their newborns' needs through the internet due to its accessibility. The internet, providing vast amounts of information, empowers mothers to seek knowledge on newborn care.

However, mothers demonstrated average knowledge of pain and fever management. This could be due to insufficient information about recognizing and managing colic pain and fever, as newborns primarily express their



discomfort through crying. Without clear indicators of symptoms, mothers may struggle to identify and manage their newborns' issues. Studies such as [Landgren and Hallström \(2011\)](#) highlight that parents often feel helpless and emotionally overwhelmed when caring for a newborn with colic pain. Similarly, [Kelly et al. \(2017\)](#) noted that a lack of knowledge on fever management remains a prevalent public health issue for parents. [Ravanipour et al. \(2014\)](#) further emphasized the need for health education and emotional support to address these concerns. Knowledge about disease management can improve maternal self-efficacy and caregiving abilities, as noted by [Bagherian et al. \(2021\)](#).

The study's socio-demographic profile revealed that the majority of participants were aged 20-25 years, which could explain the average knowledge in pain and fever management. Younger mothers, with less experience, might experience greater anxiety when caring for a newborn with colic or fever. This finding is consistent with [Chinawa et al. \(2013\)](#), who noted that older mothers tend to worry less about colic pain due to previous experience, reducing their fears.

Furthermore, the study showed that mothers with more children demonstrated better knowledge of newborn care. This finding aligns with [Teferi et al. \(2020\)](#), who found a significant association between the number of children and improved knowledge of newborn care. Similarly, mothers aged 36-40 had higher knowledge levels, as supported by the study of [Gosadi et al. \(2019\)](#), which highlighted the positive association between maternal age and competency in newborn care.

High levels of practice in cord care, pain and fever management, and stimulation of senses were also observed. This suggests that mothers' knowledge translates into practice. By putting into action what they learned from healthcare facilities, the internet, and their experiences, mothers are better able to care for their newborns. High-quality newborn care practices can significantly contribute to the newborn's well-being, helping to achieve the United Nations Sustainable Development Goals, specifically by reducing neonatal mortality.

Limitations

Several limitations should be acknowledged. First, the study used age for stratification to identify respondents, which could have affected the comparability of the sample size across different sociodemographic groups. This could limit the generalizability of the findings. Additionally, the study relied on a self-administered survey, which may have introduced response biases, as participants might have provided answers that reflect a socially desirable image of their knowledge and practices. Furthermore, the cross-sectional design of the study does not allow for the establishment of causal relationships between

knowledge and practice. Longitudinal studies could provide further insight into how maternal knowledge and practices evolve over time. Additionally, while this study focused on knowledge and practice related to key areas of newborn care, other factors such as maternal attitudes, beliefs, and access to healthcare services were not explored. These factors may also significantly impact the quality of newborn care.

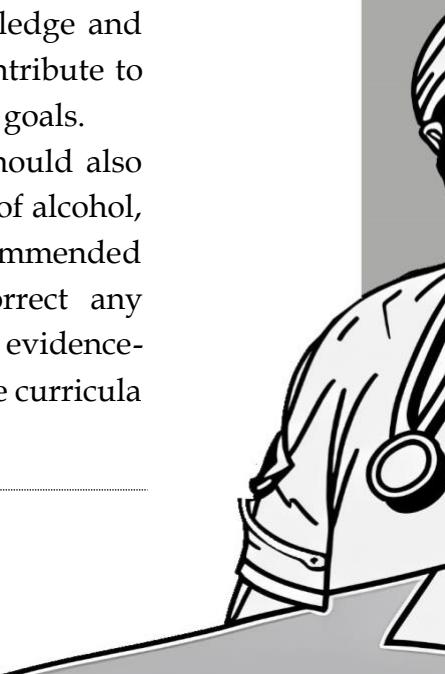
Implications for Healthcare Administration

This study highlights the importance of enhancing maternal knowledge of newborn care to improve the well-being of both mothers and their newborns. Healthcare administrators should focus on providing comprehensive educational programs that address gaps in knowledge, particularly regarding pain and fever management. Targeted interventions may be necessary for younger mothers, single mothers, or those with fewer children, as these groups showed lower knowledge in specific areas, such as pain and fever management. Tailoring programs to meet the needs of these groups could lead to more effective outcomes.

Moreover, healthcare facilities should integrate updated newborn care information into routine prenatal and postnatal care services. Incorporating guidelines on cord care, pain and fever management, and stimulation of senses into educational materials and consultations can help ensure that mothers are well-informed about current best practices. Nurses and midwives should be equipped with up-to-date knowledge and resources to deliver effective education on newborn care.

Given the significant correlation between knowledge and practice, healthcare administrators should also prioritize strategies that not only disseminate information but also support mothers in applying that knowledge in practical, real-life situations. Practical demonstrations, peer support groups, and home visits from healthcare professionals can reinforce proper care practices and provide ongoing support for mothers. By strengthening both knowledge and practice, healthcare systems can improve newborn outcomes and contribute to lowering neonatal mortality rates, which is aligned with global health goals.

In light of the study's findings, healthcare education programs should also emphasize the discontinuation of outdated practices, such as the use of alcohol, antiseptics, or ointments on the cord stump, which are no longer recommended by the DOH and WHO. Educational efforts should aim to correct any misconceptions about these practices and replace them with updated, evidence-based guidelines. Additionally, this study's insights can help shape the curricula



in health education programs, ensuring that future healthcare providers are well-equipped to deliver accurate, evidence-based care to mothers and newborns.

Conclusion

This study highlights the critical role of maternal knowledge and practices in promoting newborn care and well-being. While mothers demonstrated high knowledge in cord care and stimulation of the senses, their understanding of pain and fever management was average, highlighting a need for targeted education in these areas. The findings emphasize the importance of accessible information, particularly through healthcare programs and online resources, in enhancing maternal knowledge. The significant relationship between knowledge and practice further suggests that well-informed mothers are more likely to implement proper newborn care practices. Healthcare administrators should prioritize improving maternal education on newborn care, focusing on the most common gaps in knowledge and promoting evidence-based practices. By reinforcing correct care methods, such as the proper management of the cord and fever, healthcare systems can contribute to better neonatal outcomes and support the achievement of global health goals, particularly in reducing neonatal mortality.

Declaration of Conflicting Interest

The authors have declared no conflict of interest.

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Authors' Contributions

FV and RP both made substantial contributions to the conceptualization of topic area, literature review, data collection and data interpretations, revisions, and preparation of the final version. FV and RP approve of the final version to be published. FV and RP both agree to be accountable for all aspects of the work.

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Data Availability Statement

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

Declaration of the Use of AI in Scientific Writing

None to declare.

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